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BRIEF REPORT: Factors Associated with COVID-19 Infections Among a High-Risk Sample of Adults with Intellectual and Developmental Disabilities in Ontario

Rapport bref : facteurs associés aux infections de COVID-19 auprès d'un échantillon d'adultes à haut risque ayant une déficience intellectuelle et un trouble du développement en Ontario

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Abstract

This brief report describes the demographic and clinical profiles of 190 adult home care users with intellectual and developmental disabilities tested for COVID-19 from March 2020 to May 2021. A cross-sectional study design (n=190) was conducted. Chi-Square tests, Fisher's Exact tests, and odds ratios with 95% confidence intervals are reported. Older age and congregate living increased the odds of having a positive COVID-19 test, while dependence in personal dressing was associated with decreased odds. These findings provide useful data from the first 15 months of the pandemic; trends over time should be investigated.

Resumé

Ce rapport bref décrit les profils démographiques et cliniques de 190 résidents adultes recevant des soins à domicile et ayant un trouble développemental ou une déficience intellectuelle qui ont été testés pour la COVID-19 entre mars 2020 et mai 2021. Un devis d'étude transversale (n = 190) a été mené. Des tests du Chi carré, des tests selon la méthode exacte de Fischer, et des rapports des cotes ayant un intervalle de confiance à 95% sont présentés. Un âge avancé et la vie en habitation collective a augmenté la probabilité d'obtenir un résultat positif au test de la COVID-19, tandis que la dépendance pour l'habillage était associée à une probabilité moins élevée. Ces

résultats offrent des données utiles issues des 15 premiers mois de la pandémie; les tendances au fil du temps devraient être étudiées.

Mots-clés : COVID-19, trouble du développement, déficience intellectuelle, soins à domiciles, interRAI, adultes.

Introduction

Adults with intellectual and developmental disabilities (IDD) are more likely to contract COVID-19 and experience worse outcomes than the general population. In a US study, the presence of IDD was the strongest risk factor for COVID-19, and after age, the strongest predictor for related mortality (Gleason et al., 2021). Increased risk of mortality and hospitalization were also reported in England (Williamson et al., 2021). To date, congregate living, assistance with activities of daily living (ADLs) (Gleason et al., 2021; Landes et al., 2020a; Landes et al., 2020b), higher levels of multimorbidity (Cooper et al., 2015; Gleason et al., 2021; Matson & Cervantes, 2013), overall shorter life expectancy (Dolan et al., 2019), lower socio-economic status (Gleason et al., 2021), and difficulties with protective measures (Williamson et al., 2021) contribute to increased risk for COVID-19 in this population.

In Canada, COVID-19-related challenges to the mental health and wellbeing of adults with IDD (Lake et al., 2021), use of personal protective equipment (PPE), social distancing, and disruption in routines (Lunsky, Bobbette, et al., 2021; Redquest et al., 2021) have been described. One Canadian study found that adults with IDD had higher positivity rates, hospitalizations and mortality than the general population (Lunsky, Durbin, et al., 2021). While that study compared factors associated with positivity among adults with IDD compared to those without, it did not explore risk factors for COVID-19 among adults with IDD other than identifying a higher incidence proportion over roughly twelve months among those with Down syndrome (21.33 positive per 1000 adults with Down syndrome vs. 19.35 positive per 1000 adults with IDD). The current study identifies host and environment factors associated with positivity in a high-risk sample of adults with IDD in Ontario tested for COVID-19. It includes previously studied factors, and new ones that reflect unique challenges to social distancing and responses to changes to routine described in the Canadian studies. It was hypothesized that factors contributing to physical proximity would increase the risk of positivity.

Materials and Methods

Exemption from ethical review for secondary analysis of anonymized data was granted by the Lakehead University Research Ethics Board, as per Tri-Council Policy (Canadian Institutes of Health Research et al., 2018). Anonymized data were available as part of a data-sharing agreement with interRAI (represented by the corresponding author).

Data are based on all home care users with IDD (≥18 years) in a large metropolitan region of Ontario who were tested at least once for COVID-19 between the start of the pandemic (i.e., March 11, 2020; AJMC, 2021) and May 2021 (n=190). Testing occurred if individuals showed

symptoms or had close contact with someone who tested positive. As part of regular practice, all had been assessed with the interRAI Home Care (HC) instrument and the Intellectual Disability (ID) supplement. COVID-19 test results were linked to the most recent assessments; most had been assessed after the pandemic began (86.42%).

The interRAI HC is comprised of 200+ items related to key areas of life (e.g., cognition, functioning) (Morris et al., 2019). The ID supplement is a subset of items from the interRAI ID (Martin et al., 2007) more specific to this population (e.g., nature of IDD). Relevant host factors included age, sex, aggression, ADLs, mobility, cognitive performance, and comprehension. Only living setting was available to capture environment factors.

Performance in bathing, personal hygiene, dressing, toilet use, bed mobility, and eating are assessed using a 7-point scale from 0=independent to 6=total dependence. Categories were created to reflect the need for physical support with ADLs: no physical contact (score=0-2) versus requires physical contact (score=3-6). "Dressing" combines upper and lower body; the most dependent score was used. The Cognitive Performance Scale scores range from 0=intact to 6=very severe impairment (Morris et al., 1994); it has been validated in samples with IDD (Martin et al., 2007). Its scores were categorized: intact to mild impairment (0-2), moderate impairment (3,4), and severe impairment (5,6). Mobility was coded as impaired if a device was used or the person was bed-bound. The Aggressive Behaviour Scale ranges from 0 to 12; it was dichotomized into no aggression (0) versus any aggression (1+). Comprehension, scored from 0 to 4=Rarely/Never understands was dichotomized into usually/often understands (0-2) versus sometimes/never understands (3,4). The nature of IDD was available for 133 home care clients who had an ID supplement (70%).

Associations between the categorical variables were explored using Chi-square tests (X^2) and Fisher's Exact tests (FET). Logistic regression explored the influence of variables on positivity. Unadjusted odds ratios (ORs) with 95% confidence intervals are presented, as are adjusted ORs for the final multivariate model. The latter only includes variables significant at the bivariate level. Analyses were conducted using SAS (SAS Institute Inc, 2013).

Results

Table 1 shows sample characteristics. Overall, the mean age was 47.2 years (*SD*=18.4). The majority were male and lived in congregate settings. The nature of IDD was unspecified for about half, and similar proportions had Down syndrome and autism. About a third had minimal cognitive impairment. Fewer than half had comprehension difficulties, impaired mobility, and required physical assistance with eating or bed mobility; over 70% needed physical assistance with toilet use, and over 80% for dressing and personal hygiene. About half exhibited signs of aggression. About one-third tested positive. Only age, living setting, and dressing were associated with positivity.

Table 1

Demographic and Clinical Characteristics by COVID-19 Test Results.

	All (n=190)		Tested positive for COVID-19 (*n*=71)		Tested negative for COVID-19 (*n* =119)		*p*
	n	%	*n*	%	*n*	%	
Age groups							X^2
<30 years	48	25.26	9	12.68	39	32.77	<0.01
30-<45 years	40	21.05	12	16.90	28	23.53	
45-<60 years	43	22.63	19	26.76	24	20.17	
>60 years	59	31.05	31	43.66	28	23.53	
Sex							X^2
Male	112	58.95	42	59.15	70	58.82	0.96
Female	78	41.05	29	40.85	49	41.18	
Living setting							X^2
Private or assisted	87	45.79	18	25.35	69	57.98	<0.01
Congregate	103	54.21	53	74.65	50	42.02	
Nature of IDD[1]							FET
Cause unspecified	65	48.87	28	59.57	37	43.02	0.34
Down syndrome	17	12.78	--	--	--	---	
Autism	20	15.04	--	--	--	---	
Other	31	23.31	9	19.15	22	25.58	
Cognitive performance scale							X^2
Intact to mild	58	30.53	21	29.58	37	31.09	0.16
Moderately impaired	56	29.47	16	22.54	40	33.61	
Severe	76	40.00	34	47.89	42	35.29	
Receptive communication							X^2
Usually/Often/Always understands	109	57.37	41	57.75	68	57.14	0.94
Sometimes/Rarely/Never understands	81	42.63	30	42.25	51	42.86	
Aggressive behaviour							X^2
Any aggressive behaviour	94	49.47	32	45.07	62	52.10	0.35
No aggressive behaviour	96	50.53	39	54.93	57	47.90	

Mobility							X^2
Walking w/wo assistive device	103	54.21	35	49.30	68	57.14	0.29
Mobility devices or bed-bound	87	45.79	36	50.70	51	42.86	
Bathing[2]							FET
Supervision or independent	11	5.82	--	---	--	--	0.10
Assistance to total dependence	178	94.18	--	---	--	--	
Personal hygiene							X^2
Supervision or independent	26	13.68	13	18.31	13	10.92	0.15
Assistance to total dependence	164	86.32	58	81.69	106	89.08	
Dressing (upper or lower body)							X^2
Supervision or independent	32	16.84	17	23.94	15	12.61	0.04
Assistance to total dependence	158	83.16	54	76.06	104	87.39	
Toilet use[2]							X^2
Supervision or independent	44	24.58	18	27.27	26	23.01	0.52
Assistance to total dependence	135	75.42	48	72.73	87	76.99	
Bed mobility[2]							X^2
Supervision or independent	110	58.20	42	59.15	68	57.63	0.84
Assistance to total dependence	79	41.80	29	40.85	50	42.37	
Eating[2]							X^2
Supervision or independent	113	59.79	39	55.71	74	62.18	0.38
Assistance to total dependence	76	40.21	31	44.29	45	37.82	

[1]Not available for n=57 (n=24 for positive tests, n=33 for negative tests); [2]Missing data: n=11 for toilet use, n=1 for bathing, bed mobility and eating; --Suppressed due to small cell count.

Table 2 shows that older age and congregate setting were associated with increased odds of positivity, whereas physical support with dependence in dressing was associated with decreased odds. This remained true after adjusting for the influence of sex and the other variables significant at the bivariate variables. Congregate living and older age were associated with a threefold increase in odds of positivity (respectively, OR=3.37, 95% CI 1.66, 6.83; OR=3.20, 95% CI 1.23, 8.30), whereas dependence in dressing was associated with a 62% reduction in odds of positivity (OR=0.38, 95% CI 0.16, 0.88).

Table 2

Association Between Independent Variables and Positive COVID-19 Test: Unadjusted and Adjusted Odds Ratios (OR) with 95% Confidence Intervals (CI).

	Unadjusted				Adjusted[3]			
Variable	OR	Lower 95% CI	Upper 95% CI	*p*	OR	Lower 95% CI	Upper 95% CI	*p*
Age (30-<45 years vs. <30 years)	1.86	0.69	5.00	0.22	1.88	0.67	5.28	0.23
Age (45-<60 years vs. <30 years)	3.43	1.34	8.80	0.01	2.51	0.92	6.84	0.07
Age (≥60 years vs. <30 years)	4.80	1.98	11.65	<0.001	3.20	1.23	8.30	0.02
Congregate setting	4.06	2.13	7.76	<0.001	3.37	1.66	6.83	<0.001
Dependence in dressing	0.46	0.21	0.99	0.05	0.38	0.16	0.88	0.02

[3]Adjusted for age group, sex, congregate setting, and dependence in dressing.

Discussion

Older age and congregate settings were risk factors for positive COVID-19 tests, which aligns with the findings of Landes et al. (2020a). There also appeared to be an increasing effect with age. The observed effect of age could be confounded by living in congregate settings as older individuals with IDD are more likely to be living in congregate settings compared to younger persons. After adjustment, the oldest age group and those living in congregate settings had increased odds of testing positive. These findings are concerning given the increased odds of COVID-19 hospitalization and mortality observed among older persons and those with IDD compared to the general population (Gleason et al., 2021; Landes et al., 2020b).

Dependence in most ADLs was not associated with positive COVID-19 tests; however, dependence in dressing had a protective effect. This finding was unexpected, as it was hypothesized that those requiring support with ADLs might be at increased risk for COVID-19 given the physical proximity needed to receive that support (Landes et al., 2020a). Professionals and other caregivers supporting individuals requiring ADL support may have also been aware of the risk such support poses, and mitigated it by engaging in protective behaviours, such as

wearing masks, using other personal protective equipment (PPE), and remaining socially distanced whenever possible.

The primary limitation of this study was the small sample size. There was sufficient power to detect strong associations (OR >2.5 or <0.4) in the adjusted multivariate model for congregate setting, age ≥60 years, and dependence in dressing, but the study was underpowered for weaker associations. Small sample sizes may have contributed to the lack of association between positivity and characteristics previously identified in the literature. For instance, a post-hoc analysis revealed that the power to detect the observed ORs as statistically significant for severe cognitive impairment (OR=1.43), receptive communication (OR=1.8), and aggression (OR=0.75) in this sample were 17%, 49%, and 16%, respectively. In addition, specific details on congregate living were not available, such as the number of residents living in each setting; therefore, the difference between private and congregate setting could not be quantified by the number of residents. It should also be noted that for 26 participants, the interRAI HC and ID supplement assessments occurred prior to the pandemic (March 11, 2020). It is possible that some modifiable factors (e.g., living setting) may have changed since these participants' assessments.

In the first fifteen months of the pandemic, adults with IDD experienced increased odds related to COVID-19 diagnoses, especially older adults and those living in congregate settings. Monitoring COVID-19 diagnoses in this group is essential for identifying risk factors associated with COVID-19. These findings could be used to inform the management of COVID-19 among this population. Ongoing monitoring of risk is critical throughout the pandemic as new variants emerge and as vaccines continue to roll out across the province.

Future studies will include ongoing monitoring of this group of individuals, which will be essential for understanding longitudinal changes in COVID-19 spread among Ontarians with IDD. In time, a larger sample and longer follow-up will allow for further analyses to control for confounding and examine possible effect modification.

Key Messages

People with disabilities: It is important to know that people who are older and living in group homes may get COVID-19 more often. It looks like support workers are aware that people who need help may be more at risk, and so are being extra careful.

Professionals: Living in congregate settings and older age are associated with increased odds of COVID-19 among persons with intellectual and developmental disabilities (IDD). Results indicate that the potential risk associated with dependence in activities of daily living may have been mitigated by the increased diligence of support workers and caregivers (for example, wearing personal protective equipment and socially distancing when possible).

Policy makers: Prioritizing of adults with IDD living in congregate settings and older adults for vaccinations is essential, given that persons with IDD are known to experience more severe COVID-19 outcomes.

Messages clés de cet article

Personnes ayant une incapacité : Il est important de savoir que les personnes qui sont plus âgées et qui habitent en foyers de groupe risquent d'être infecté plus souvent par la COVID-19. Il semble que le personnel de soutien est au courant que les personnes qui ont besoin d'aide sont plus à risques, et est conséquemment plus prudent.

Professionnels : Vivre dans un logement collectif et être plus âgé sont associés à un risque accru de la COVID-19 auprès de personnes ayant une déficience intellectuelle ou un trouble de développement. Les résultats indiquent que le risque potentiel associé à la dépendance dans les activités de la vie quotidienne puisse avoir été atténué par l'assiduité accrue du personnel de soutien et des donneurs de soins (par exemple, porter un équipement de protection individuel et respecter la distanciation sociale lorsque cela est possible).

Décideurs : Prioriser la vaccination des adultes ayant une déficience intellectuelle ou un trouble du développement qui sont plus âgés et qui vivent dans des habitations collectives est essentiel, étant donné que ces personnes sont connues pour ressentir des conséquences plus graves de la COVID-19.

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